

AMENDMENTS TO THE CLAIMS

1. (Cancelled)

2. (Cancelled)

3. (Cancelled)

4. (Cancelled)

5. (Cancelled)

6. (Currently Amended) ~~The~~ A compact imaging spectrometer apparatus,  
comprising:

an entrance slit for directing light,

a first mirror that receives said light and reflects said light,

an immersive diffraction grating that diffracts said light, ~~of claim 1~~

wherein said immersive diffraction grating has rulings that are cut on the plano  
side of a wedged plano-convex or plano-concave lens,

a second mirror that focuses said light, and

a detector array that receives said focused light.

7. (Cancelled)

8. (Cancelled)

9. (Cancelled)

10. (Currently Amended) ~~The~~ A compact imaging spectrometer  
apparatus, comprising:

an entrance slit for directing light,

a first mirror that receives said light and reflects said light,

an immersive diffraction grating that diffracts said light,

a second mirror that focuses said light, and

a detector array that receives said focused light, ~~of claim 1~~

wherein said apparatus has a front and a back, and wherein said entrance slit and said detector array are located at or near said ~~front~~ front, and wherein said second mirror that focuses said light is located at or near said back.

11. (Cancelled)

12. (Currently Amended) The An infrared reflective imaging spectrometer apparatus, comprising:

an entrance slit for directing light,

a concave reflective primary mirror for reducing the divergence of said light from said entrance slit,

a wedged germanium or zinc selenide immersed grating dispersing said light, ~~of claim 11~~ wherein said wedged germanium or zinc selenide grating has a wedge angle that provides slit curvature correction and wherein said light passes through said wedged germanium or zinc selenide grating substrate and is spectrally dispersed by said reflecting immersed grating, and

a concave reflective secondary mirror focusing said light onto a two-dimensional detector array.

13. (Cancelled)

14. (Currently Amended) The An infrared reflective imaging spectrometer apparatus, comprising:

an entrance slit for directing light,

a concave reflective primary mirror for reducing the divergence of said light from said entrance slit,

a wedged germanium or zinc selenide immersed grating dispersing said light,

and

a concave reflective secondary mirror focusing said light onto a two-dimensional detector array, ~~of claim 11~~ wherein the said concave reflective

primary and said concave reflective secondary mirror have conic sections or rotational aspheric sections or toric sections.

15. (Cancelled)

16. (Currently Amended) ~~The~~ An infrared reflective imaging spectrometer apparatus, comprising:

an entrance slit for directing light,

a concave reflective primary mirror for reducing the divergence of said light from said entrance slit,

a wedged germanium or zinc selenide immersed grating dispersing said light, of claim 11 wherein said wedged germanium or zinc selenide grating is a holographic grating that provides further aberration and distortion correction, and

a concave reflective secondary mirror focusing said light onto a two-dimensional detector array.

17. (Currently Amended) ~~The~~ An infrared reflective imaging spectrometer apparatus, comprising:

an entrance slit for directing light,

a concave reflective primary mirror for reducing the divergence of said light from said entrance slit,

a wedged germanium or zinc selenide immersed grating dispersing said light, of claim 11 wherein said wedged germanium or zinc selenide grating is a diffraction grating with non-uniform groove spacings, and

a concave reflective secondary mirror focusing said light onto a two-dimensional detector array.

18. (Cancelled)

19. (Cancelled)

20. (Cancelled)

21. (Currently Amended) ~~The~~ infrared reflective imaging spectrometer apparatus, comprising:

an entrance slit for directing light,

a concave reflective primary mirror for reducing the divergence of said light from said entrance slit,

a wedged germanium or zinc selenide immersed grating dispersing said light, ~~of claim 11~~ wherein optical materials for said wedged grating are materials that transmit visible light for operation in the visible spectral region, and

a concave reflective secondary mirror focusing said light onto a two-dimensional detector array.

22. (Currently Amended) ~~The~~ An infrared reflective imaging spectrometer apparatus, comprising:

an entrance slit for directing light,

a concave reflective primary mirror for reducing the divergence of said light from said entrance slit,

a wedged germanium or zinc selenide immersed grating dispersing said light,

a concave reflective secondary mirror focusing said light onto a two-dimensional detector array, and ~~of claim 11 including~~

a lens added in front of said detector array to control the field curvature.

23. (Original) An infrared reflective imaging spectrometer, comprising:

an entrance slit for admitting light,

a concave reflective primary mirror focusing said light from said entrance slit,

a convex reflective secondary mirror diverging said light,

a wedged germanium or zinc selenide immersed grating for dispersing said light, said wedged germanium or zinc selenide grating having a wedge

angle providing slit curvature correction, wherein said light passes through said wedged germanium or zinc selenide grating to be spectrally dispersed by said reflecting immersed grating,

a convex reflective tertiary mirror diverging said light; and

a concave reflective quaternary mirror focusing said light onto a two-dimensional detector array.

24. (Original) The infrared reflective imaging spectrometer apparatus of claim 23 wherein said wedged germanium or zinc selenide grating has a wedge angle that provides slit curvature correction and wherein said light passes through said wedged germanium or zinc selenide grating substrate and is spectrally dispersed by said reflecting immersed grating.

25. (Original) The infrared reflective imaging spectrometer apparatus of claim 23 wherein some or all of said primary, secondary, tertiary and quaternary mirrors have conic sections or rotational aspheric sections or toric sections for further aberration correction.

26. (Currently Amended) The infrared reflective imaging spectrometer apparatus of claim 23 wherein the said wedged grating includes transmissive grating grooves and is transmissive and ~~Wherein the~~ wherein said light passes through said grating and is spectrally dispersed by said transmissive grating grooves.

27. (Original) The infrared reflective imaging spectrometer apparatus of claim 23 wherein said wedged germanium or zinc selenide grating is a conventional straight grooved grating.

28. (Original) The infrared reflective imaging spectrometer apparatus of claim 23 wherein said wedged germanium or zinc selenide grating is a holographic grating that provides further aberration and distortion correction.

29. (Original) The infrared reflective imaging spectrometer apparatus of claim 23 wherein said wedged germanium or zinc selenide grating is a diffraction grating with non-uniform groove spacings.

30. (Original) The infrared reflective imaging spectrometer apparatus of claim 23 wherein said wedged germanium or zinc selenide grating is a diffraction grating with curved groove spacings that provide further aberration and distortion correction.

31. (Currently Amended) The infrared reflective imaging spectrometer apparatus of claim 23 wherein said wedged grating includes surfaces and wherein said surface are adapted to receive power ~~is added to surfaces of said wedged grating~~ for greater distortion and field curvature correction.

32. (Currently Amended) The infrared reflective imaging spectrometer apparatus of claim 23 wherein ~~other optical materials for said wedged grating are substituted~~ includes materials that transmit visible light for operation in the visible spectral region to enhance the transmittance in the near, mid or long wave infrared regions.

33. (Original) The infrared reflective imaging spectrometer apparatus of claim 23 wherein optical materials for said wedged grating are materials that transmit visible light for operation in the visible spectral region.

34. (Original) The infrared reflective imaging spectrometer apparatus of claim 23 including a lens added in front of said detector array to control the field curvature.